

We Claim:

1. An isolated, purified, or recombinant protein complex comprising:
 - (i) an MK2 polypeptide; and
 - (ii) an MK2 interacting protein chosen from STS, HPH2 and Shc.
2. The complex of claim 1, comprising an MK2 polypeptide and at least one MK2 interacting protein.
3. The complex of claim 2, wherein the MK2 interacting protein is chosen from STS, HPH2 and Shc.
4. The complex of claim 1, comprising an MK2 polypeptide and at least two MK2 interacting proteins.
5. The complex of claim 4, wherein the MK2 interacting proteins are chosen from STS, HPH2 and Shc.
6. The complex of claim 1, wherein the MK2 polypeptide comprises a fusion protein.
7. The complex of claim 6, wherein the fusion protein comprises a domain for purifying, isolating or detecting the fusion protein.
8. The complex of claim 6, wherein the fusion protein comprises a domain chosen from the group consisting of: affinity tags, radionucleotides, enzymes, and fluorophores.
9. The complex of claim 7, wherein the domain is selected from the group consisting of: polyhistidine, FLAG, Glu-Glu, glutathione S transferase (GST), thioredoxin, protein A, protein G, and an immunoglobulin heavy chain constant region.

65

ART 34 AMDT

10. A host cell comprising a first nucleic acid and a second nucleic acid, wherein the first nucleic acid encodes a recombinant MK2 polypeptide and the second nucleic acid encodes an MK2 interacting protein chosen from STS, HPH2 and Shc.

11. The host cell of claim 10, further comprising a third nucleic acid encoding a second MK2 interacting protein chosen from STS, HPH2 and Shc.

12. An assay for determining whether a test compound inhibits or promotes formation of a protein complex comprising:

(a) forming a reaction mixture including an MK2 polypeptide, at least one MK2 interacting protein and the test compound; and

(b) detecting the presence of the protein complex between MK2 and the MK2 interacting protein;

wherein a difference in the amount of complex in the presence of the test compound, relative to the amount of complex in the absence of the test compound indicates that the test compound inhibits or promotes complex formation.

13. The assay of claim 12, wherein an increase in the amount of complex in presence of the test compound indicates that the test compound promotes complex formation.

14. The assay of claim 12, wherein a decrease in the amount of complex in presence of the test compound indicates that the test compound inhibits complex formation.

15. A method for determining whether a test compound affects MK2 activity comprising:

(a) forming a protein complex comprising an MK2 polypeptide and an MK interacting protein;

(b) contacting the protein complex with the test compound, and

66

(c) determining the effect of the test compound on one or more activities chosen from MK2 kinase activity, an amount of MK2 in the complex, production of TNF, and amount of phosphorylated form of a substrate of MK2.

16. A screening assay to identify compounds that inhibit or promote formation of a protein complex, comprising

(i) providing a two-hybrid assay system including a first fusion protein comprising an MK2 polypeptide, and a second fusion protein comprising a polypeptide chosen from one or more of STS, HPH2 and Shc, under conditions wherein the two proteins interact in the two hybrid assay system;

(ii) measuring a level of interaction between the fusion proteins in the presence and in the absence of a test compound; and

(iii) comparing the level of interaction of the fusion proteins,

wherein a decrease in the level of interaction is indicative of a compound that inhibits the interaction between the MK2 polypeptide and a polypeptide chosen from one or more of STS, HPH2 and Shc.

17. An antibody that binds one or more proteins in a complex comprising an MK2 polypeptide and an MK2 interacting protein chosen from STS, HPH2 and Shc.

18. The antibody of claim 17, wherein the antibody inhibits interaction of MK2 with the MK2 interacting protein.

19. A method for modulating formation of a protein complex in a cell comprising at least a first protein and a second protein, wherein the first protein is an MK2 polypeptide and the second protein is chosen from one or more of STS, HPH2 and Shc, and wherein the method comprises administering to the cell a compound capable of modulating formation of the complex.

20. A method of producing a complex comprising:

67

transfecting a cell with one or more polynucleotides encoding an MK2 polypeptide and an MK2 interacting protein chosen from one or more of STS, HPH2 and Shc, whereby the polypeptides form a complex.

21. A drug screening method for identifying anti-inflammatory drugs comprising:
 - a) providing MK2 and at least one MK2-interacting protein;
 - b) allowing MK2 and the protein to interact to form a complex;
 - c) adding an effective amount of a potential drug to the complex; and
 - d) determining whether the potential drug inhibits complex formation.
22. The method of claim 21, wherein MK2 and the protein interact *in vivo* in a yeast 2-hybrid system.
23. The method of claim 21, wherein MK2 and the protein interact *in vivo* in a mammalian 2-hybrid system.
24. The method of claim 21, wherein MK2 and the protein interact *in vitro*.
25. The method of claim 21, wherein the protein is STS.
26. The method of claim 21, wherein the protein is Shc.
27. The method of claim 21, wherein the protein is HPH2.
28. The method of claim 21, wherein the drug is a small molecule.
29. The method of claim 21, wherein the drug is a peptide or protein.
30. The method of claim 21, wherein the drug is an antibody.
31. The method of claim 21, wherein the drug is a chemical agent.
32. A method of modulating inflammation in a tissue comprising:
 - a) administering a nucleic acid to the tissue, wherein the nucleic acid encodes an MK2 interacting protein; and
 - b) allowing the nucleic acid to express the MK2 interacting protein, thereby to modulate inflammation in the tissue.

68

33. The method of claim 32, wherein the nucleic acid expresses a protein chosen from STS, HPH2 and Shc.

34. A method of treating or preventing inflammation in a tissue comprising administering to the tissue a therapeutically effective amount of at least one agent, wherein the agent either

- a) blocks the interaction between MK2 and an MK2 interacting protein; or
- b) allows the interaction, but blocks MK2 activity.

35. The method of claim 34, wherein the agent is an antibody.

36. The method of claim 35, wherein the antibody is a polyclonal antibody.

37. The method of claim 35, wherein the antibody is a monoclonal antibody.

38. The method of claims 35-37, wherein the antibody binds MK2.

39. The method of claims 35-37, wherein the antibody binds the MK2-interacting protein.

40. The method of claim 34, wherein the agent is a chemical agent.

41. The method of claim 34, wherein the agent is a peptide or protein.

42. The method of claim 34, wherein the agent is a small molecule.

43. A method of modulating inflammation in a tissue comprising:

- a) contacting the tissue with at least one protein that binds MK2; and
- b) allowing the protein to modulate inflammation in the tissue.

44. A method of treating a patient suffering from at least one inflammatory condition, comprising:

- a) administering a therapeutically effective dose of at least one compound chosen from a compound that interacts with at least one of MK2 or an MK2 complex, wherein the compound is chosen from an antibody, a chemical agent, a small molecule, a protein and a peptide; and

65

b) allowing the compound to bind to At least one of MK2 or an MK2 complex and modulate inflammation.

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~~44.~~ The method of claim 43, wherein the protein or peptide is a mutant form of a wild-type protein or peptide which stimulates MK2 activity.

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~~45.~~ The method of claim 43, wherein the protein is chosen from STS, HPH2 and Shc.

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~~46.~~ The method of claim 43, wherein the condition is chosen from Crohn's disease, inflammatory bowel disease, ulcerative colitis, rheumatoid arthritis, acute respiratory distress syndrome, emphysema, delayed type hypersensitivity reaction, asthma, systemic lupus erythematosus, and inflammation due to trauma or injury.

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~~47.~~ A method of expressing a nucleic acid in a cell to inhibit inflammation, comprising

a) adding at least one nucleic acid encoding a compound chosen from a compound that interacts with at least one of MK2 or an MK2 complex, wherein the compound is chosen from an antibody, a chemical agent, a small molecule, a protein and a peptide; and

b) allowing the cell to express the compound and inhibit inflammation.

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~~48.~~ The method of claim 47, wherein the nucleic acid encodes a protein chosen from STS, HPH2 and Shc.

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~~49.~~ A method of detecting at least one of the absence, presence, and amount of MK2 in a sample, comprising

a) administering at least one compound that interacts with at least one of MK2 or an MK2 complex, wherein the compound is chosen from an antibody, a chemical agent, a small molecule, a protein and a peptide; and

70

b) correlating the absence, presence, or amount of bound protein or compound with the absence, presence, or amount of MK2 in the sample.

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~~50.~~ The method of claim 49, wherein the protein is chosen from STS, HPH2 and Shc.

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~~51.~~ A kit, wherein the kit enables qualitative detection of MK2 comprising a compound that interacts with at least one of MK2 or an MK2 complex, wherein the compound is chosen from an antibody, a chemical agent, a small molecule, a protein and a peptide; and at least one other kit component chosen from:

a) at least one of buffer and solution;

b) at least one structural component.

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~~52.~~ The kit of claim 51, further comprising an agent that binds the protein or compound.

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~~53.~~ The kit of claim 52, wherein the agent is an antibody.

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~~54.~~ The kit of claim 51, wherein the protein is chosen from STS, HPH2 and Shc.

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~~55.~~ A pharmaceutical composition comprising:

a) at least one protein that binds MK2, and

b) at least one pharmaceutically acceptable carrier.

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~~56.~~ The composition of claim 55, wherein the protein is chosen from STS, HPH2 and Shc.

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~~57.~~ The protein complex of claim 1, wherein the MK2 interacting protein is encoded by a cDNA molecule comprising a nucleotide sequence chosen from SEQ ID NOs:1, 2 and 3. ✓

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~~58.~~ The protein complex of claim 1, wherein the MK2 interacting protein is encoded by a cDNA molecule comprising a nucleotide sequence chosen from

71

fragments; splice variants; addition, deletion and substitution mutants; and homologues of SEQ ID NOs:1, 2 and 3, wherein the MK2 interacting protein binds MK2.

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~~59.~~

The protein complex of claim 1, wherein the MK2 interacting protein comprises an amino acid sequence chosen from SEQ ID NOs:4, 5, and 6. ✓

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The protein complex of claim 1, wherein the MK2 interacting protein comprises an amino acid sequence chosen from fragments; splice variants; addition, deletion and substitution mutants; and homologues of SEQ ID NOs:4, 5, and 6, wherein the MK2 interacting protein binds MK2.

72

AMENDED SHEET

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